NeoBiota 38: 97–98 (2018)
doi: 10.3897/neobiota.38.23858
http://neobiota.pensoft.net

BOOK REVIEW

A peer-reviewed open-access journal
NeoBiota
Advancing research on alien species and biological invasions

Book Review: Invasion Dynamics by Cang Hui and David M. Richardson

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Received 24 January 2018 | Accepted 25 January 2018 | Published 6 June 2018

Citation: Dawson W (2018) Book Review: Invasion Dynamics by Cang Hui and David M. Richardson. NeoBiota 38: 97–98. https://doi.org/10.3897/neobiota.38.23858

Invasion Dynamics by Cang Hui and David M. Richardson, Oxford University Press, 2017. 322pp. hbk.: GB£75.00, ISBN 978-0-19-874533-4; pbk.: GB£37.99, ISBN 978-0-19-874534-1

Invasion biology has grown considerably as a discipline within the past few decades, but it has arguably lacked the firm theoretical foundations by which other subfields are supported. In this book, Hui and Richardson attempt to fix invasion biology on a more rigorous, theoretical footing. The authors focus the book specifically on the spread and impact dynamics of invasive species, thus leaving work on introduction pathways and other aspects concerning the beginning of the invasion process to other authors. This is not a negative, as it allows the book to go into more depth and detail on how the dynamics of the latter stages of invasions can be described mathematically. *Invasion Dynamics* starts with a useful, informative and concise introduction to the field of invasion biology, covering both its history and key themes (Chapter 1, 'Setting the scene'). The book is then divided into three parts. Part I is concerned with the dynamics of invasions: Chapter 2 covers the dynamics of spread; Chapter 3 describes modelling spatial dynamics; Chapter 4 covers dispersal and range expansion; and Chapter 5 is concerned with non-equilibrium dynamics. In part II, the book turns to impacts of invasive species: Chapter 6 discusses the role of biotic interactions; Chapter 7 covers regime shifts; Chapter 8 is concerned with community assembly and succession; and Chapter 9 discusses monitoring and management of invasions. Finally,

in part III, Hui and Richardson present a synthesis: in Chapter 10, complex adaptive networks are put forward as an approach to uniting the concepts of invasiveness and invasibility; and finally Chapter 11 explores how we can manage biological invasions in the Anthropocene.

The mathematical, theoretical grounding of much of invasion biology is in general a strong point of the book, although the sometimes "maths-heavy" nature of the text may not be for everyone. Another important plus is the recognition that invasion biology is not an independent discipline, but is rather built upon general theories and models developed in the wider field of ecology, which are frequently referred to and invoked throughout. It is somewhat refreshing to read an invasion biology book that does not appear to separate the discipline from the rest of ecology, but instead acknowledges ecological theory as being fundamental to furthering our understanding of invasions. The book is richly illustrated with figures drawn from invasion literature, often representing examples of specific invasions. *Invasion Dynamics* is replete with references that, on the whole, represent a fair reflection of this burgeoning field. However, a slight downside to the book is that, apart from a few extra plates, the book is entirely in monochrome. Some figures may well benefit from being in colour and it appears this was realised to some extent with the insertion of a few colour plates. The three sections (spread, impact, synthesis) are helpful, though the synthesis section seems a little short with only two chapters. The chapter on complex adaptive networks is a useful and fascinating starting point, though it is heavy on general theory and lighter on its application to unite invasiveness and invasibility; this probably simply reflects the nascence of this very interesting research direction.

Overall, *Invasion Dynamics* is a thorough and commendable attempt to give invasion biology a mathematically rigorous basis. The attempt is largely successful, although this book is perhaps most suitable for advanced (and mathematically "savvy") researchers in the field.